IS

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CONTAGIOUS,

AND DOES IT BELONG TO THE

ZYMOTIC GROUP?

By W. H. WEBB, M. D.

PHILADELPHIA:

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WM. H. WEBB, M. D.

Dear Sir:—

It is with much pleasure that I inform you of the following Resolution, passed at the last meeting of the "SYDENHAM MEDICAL COTERIE," viz:—

"RESOLVED:—That it is the desire of this Coterie, that Dr. Webb publish in full, in pamphlet form, his able and elaborate paper entitled 'IS PHTHISIS PULMONALIS CONTAGIOUS, AND DOES IT BELONG TO THE ZYMOTIC GROUP?' read before the Coterie at its meeting, February 5, 1878, and that the Secretary be requested to furnish Dr. Webb with a copy of this Resolution."

Yours truly,

J. F. HOLT, M. D.,
Secretary.

Is Phthisis Pulmonalis Contagious, and does it belong to the Zymotic Group?*

By W. H. WEBB, M. D.

ONE of the most important and interesting questions in connection with phthisis, and one on which great diversity of opinion exists, is that of its contagiousness. From time immemorial this disease has existed, and is justly regarded as the most insidious and dangerous of all pulmonary affections. No age is exempt, and, on the authority of Laennec,† the unborn fœtus has been affected with it. ("Guizot, in four hundred *post-mortem* examinations of the bodies of new-born infants, failed to find a single deposit of tubercle. Gluze asserts that there is no born tubercle."‡) It is an epidemic, so to speak, constantly at work, and counting its victims by the hundreds of thousands annually. It heads the mortality list of nearly every civilized country, and its mode of propagation, therefore, becomes an extremely important subject for study.

In order to convey a better, and at the same time a clearer idea of the formidable mortality, attention is directed to the following:—

In this City the total mortality, for a period of ten years,

*An abstract of this paper appeared in the *American Journal of the Medical Sciences*, for April, 1878, since which time it has been revised and augmented.

† "Diseases of the Chest," London, 1834, page 306.

‡Quoted by Dr. Durant, "Transactions of the New York State Medical Society," 1871, page 174.

from 1867 to 1876, as shown by the Board of Health Reports, was 165,052. Of this $13\frac{3}{5}$ per cent. was from Phthisis, and of this number $50\frac{9}{10}$ per cent. were females, and $49\frac{1}{10}$ per cent. were males, showing an excess of $1\frac{4}{5}$ per cent. of the former over the latter.

From the earliest history down to the present time this disease has been, and is yet, one of those impenetrable mysteries which has baffled the investigations of the most competent observers in medicine, and it may be justly stated that no affection has been more persistently and patiently studied; indeed, it has been a battle field, as it were, of some of the most fierce controversies. The various works and monographs written upon it are more copious than those of any other, save, perhaps, that of cholera, and cover a period of over two thousand years; the titles alone would fill a large octavo volume.

Let us glance along this labyrinthian road of marvelous research, made royal by the eminent men who have labored so assiduously to straighten its course, and at the same time made sacred by those who, by constant and laborious study—Bayle, Young, Laennec, Dance, Delaburg, and many others—have sacrificed their lives in endeavoring to discover, if possible, its cause, prevention, retardation or cure, and ascertain if contagion is not one of the causes, as there is no doubt that it has produced results as sad as unexpected.

The following case of pulmonary phthisis from contagion, occurred in the practice of the writer, and led to the study, the result of which is given in the present article:—

In January, 1874, I was requested to attend Mrs. S., aged twenty-four years, who was suffering from phthisis. It was found difficult at first to convince her parents, as also her husband, to believe that that was the real cause of her illness, as they stated that "consumption was not known in the family of either father or mother; that her maternal grand-

mother was still living, now a lady seventy-five years old, and healthy in every particular; and that her paternal grandfather was accidently drowned about two years ago, aged eighty-one years, while endeavoring to drive across a ford, during high water, of one of the streams of West Virginia. Both families are long lived." On making further inquiry it was found that during the Winter and Spring of 1873, she was in constant attendance upon a lady friend who had phthisis, and for whom she had the most fond attachment, and who died in May of that year. Mrs. S. was not married at that time. She died the latter part of March, 1874.

Before proceeding, however, it is important to understand what is meant by contagion, and there is a diversity of opinion in regard to its definition. We have adopted that of Anglada, of Montpellier, quoted and accepted by Trousseau:*—

"Contagion is the transmission of a disease, from one person affected with that disease, to one or more persons through the medium of a material cause, (*principe materiel,*) the product of a specific morbid elaboration:—This material cause communicated to an individual in a state of health determines the same phenomena and symptoms in him as were observed in the individual from whom the germ proceeded."

Understanding what we mean by the term, we will now look at the opinions of the older writers, as well as those of more recent date, in regard to the contagiousness of the disease in question:—

Hippocrates makes no reference to the contagion of phthisis, or to the subject of contagion with regard to any disease, and he is mentioned here because his views exerted a powerful influence over medical thought until the early

*"Clinical Medicine," Philadelphia, 1873, Vol. I, page 457.

part of the seventeenth century. It is Aristotle,* who flourished about half a century after Hippocrates, to whom the credit is due of being the first physician to look upon phthisis as being a contagious disease. In the eighth section of the Problems, he inquires:—

"Why are consumptions, psora, and ophthalmiæ communicated to those who approach near to the person affected by them, while dropsy, fevers, and apoplexy are not communicated in such a manner? Is it because the eye sympathysizes most readily with the affections of external objects, moving when they move, and being disturbed when they are disturbed? And because consumption makes the breath corrupt and offensive; but these diseases are most easily communicated, in which the breath is so vitiated, as, for example, in the pestilence; and those who approach the diseased person, breathe the air thus affected, and acquire the same disease which has vitiated it, as if it had been vitiated by their own respiration."

Galen says†:—

"It is dangerous also to live with those laboring under consumption, and, in a word, with all those having a putrid respiration of such a nature as to render the houses in which they lie fetid."

Riverius, in speaking of the causes of phthisis, says‡:—

"Moreover, they are external causes, as contagion, which is the chiefest; for this disease is infectious, that we may observe women to be infected by their husbands, and men by their wives, and all their children to die of the same; nor only from infection of their parents' seed, but from the company of him that was first infected."

*"Practical and Historical Treatise on Consumptive Diseases," by T. Young, M. D., London, 1815, page 121.

†"Paulus Aegineta," Sydenham Society, 1844, Vol. I, page 286.

‡"Practice of Physic," London, 1668, page 170.

R. Morton states* :—

"This disease is also propagated by infection. For this distemper—as I have observed by frequent experience—like a contagious fever, does infect those that lie with the sick person with a certain taint."

Baume says† :—

"By the observations which I have made, I judge that phthisis proves contagious in a healthy subject (or person) of phlegmonous temperament, and which gives the same characteristics as are observed in the development of that formidable malady."

Cullen states‡ :—

"It has been frequently supposed by physicians that the phthisis is a contagious disease; and I dare not assert that it never is such."

Heberden states§ :—

"I have not seen proof enough to say that the breath of a consumptive person is infectious; yet I have seen too much appearance of it to be sure that it is not; for I have observed several die of consumption in whom infection seemed to be the most probable origin of their illness, from their having been the constant companions, or bed-fellows, of consumptive persons."

E. Darwin, in speaking of the contagion of Phthisis, states‖ :—

"I have myself seen three or four instance where a husband and wife, who have slept together, and have thus much received each others breath, who have infected each

*"Phthisiologia, or a Treatise of Consumptions," London, 1694, page 67.
†"Phthisie Pulmonaire," Montpellier, 1789, Vol. I, page 189.
‡"Practice of Medicine," Edinburgh, 1790, Vol. II, page 390.
§"Commentaries on the History and Cure of Disease," London, 1802, page 375.
‖"Zoonomia," Philadelphia, 1818, Vol. I., page 311.

other, and both died in consequence of the original taint of only one of them."

Good, in speaking of the contagion of the disease in question, says* :—

"I myself have been witness to various cases which could not be ascribed to any other cause."

C. B. Coventry says† :—

"It will probably excite some surprise that I place contagion among the existing causes of consumption. The opinion, however, is far from being new, and I am well convinced that it deserves a much more prominent place than is allotted to it by most English and French writers."

S. G. Morton says‡ :—

"No case that I could attribute to such a source has come under my notice. * * * Yet a remarkable instance occurred to me, which may be mentioned in a few words : — I attended the wife of an innkeeper, in chronic consumption ; she died after being ill for nearly two years. Her husband was a short, athletic, florid-complexioned man, the very reverse of what we see in phthisis, and yet he also died of that disease six months after his wife."

In a foot-note he further states :—

"In doubting the contagious nature of phthisis I do not wholly deny it."

Bright and Addison assert§ :—

"How far contagion is to be admitted amongst the exciting causes of phthisis will perhaps ever remain a matter of dispute ; certain, however, it is, that more than sufficient evidence exists, that those who too narrowly watch over the

*"Study of Medicine," Fourth Am. Ed., Boston, 1826, Vol. III., page 267.
†*United States Medical and Surgical Journal*, New York, 1835, Vol. I., page 391.
‡"Illustrations of Pulmonary Consumption," Philadelphia, 1837, page 80.
§"Elements of the Practice of Medicine," London, 1839, Vol. I., page 294.

declining health of their relatives and friends, while gradually sinking under their melancholy disease, often fall victims to the same complaint; and although frequently the predisposition may be plainly traced, and the circumstances of anxiety, of disturbed rest, of confinement and of unwholesome atmosphere, afford abundant explanations of the event, still the uncertainty in which the question is involved fully authorizes us, and even peremptorily commands us, to adopt every precaution which prudent foresight can suggest."

Prof. Dunglison states* :—

"It can be understood, however, that if a person be constantly breathing the generally deteriorated atmosphere of the rooms which the consumptive occupy, by sleeping, perhaps, in the same bed, the health may ultimately suffer, tuberculous cachexia be induced, ultimately confirmed phthisis."

Hastings states† :—

"I am satisfied the disease is sometimes, and under favourable circumstances, contagious. I have known the wife too often sacrificed through her attentions to the husband, and the husband to the wife—witnessed friends, attendants, and nurses perish through onerous and long-continued duties on consumptive patients, particularly before they have reached that age when there is little risk of contagion, to remain longer sceptical on this subject. * * * I should be apprehensive for the safety of any one who was in close and constant attendance upon a consumptive patient, although I admit that many individuals escape altogether from the disease, however great the exciting cause may be."

*"Practice of Medicine," Philadelphia, 1844, Vol. I, page 365.
†"Pulmonary Consumption," London, 1845, page 20.

Drake says* :—

"Without referring to books, I may state that many of our own physicians have met with apparent contagious propagation, generally where it would be most likely to occur—that is, in the conjugal state—and therefore under circumstances the least equivocal, seeing that it does not often happen that both parties belong to consumptive families. This very day I was informed by Prof. Miller, that in his (extensive) practice, he has repeatedly seen wives attacked with phthisis soon after nursing their husbands through that disease, or *vice versa*. This I have myself often witnessed, and may mention a single case which occurred long since. A newly married woman, having an hereditary predisposition, fell into phthisis soon after the birth of her first child; while at the breast it became affected with the same disease, which, I admit, might have been entailed upon it. Being poor, the family inhabited a single room, and the husband was the sole attendant upon both, with whom he also lodged. Soon after their death, without having any known predisposition, he was seized with the same malady, which proved rapidly fatal. The following observation was communicated to me by Dr. Carroll:—The daughter of a man who had a family predisposition to consumption, returned home from school with that disease. Her mother, a robust woman, nearly fifty years of age, and entirely free from hereditary taint, nursed her without intermission, and slept in the same bed with her. Soon after she died, the mother was seized with the same malady, and died also.

With such facts before us, we may, I think, regard it as highly probable that one of the causes of a tubercular diathesis is the continued or frequent inhalation, and the slow absorption of gaseous or suspended tubercular matter, exhaled by a phthisical patient."

*"Principal Diseases of the Interior Valley of North America," Philadelphia, 1854, page 915.

Watson denies that phthisis is contagious, yet he says* :—

"Nevertheless, if consulted on the subject, I should, for obvious reasons, dissuade the occupation of the bed, or even of the same sleeping apartment, by two persons, one of whom was known to labour under pulmonary consumption."

Copland says† :—

"Emanations from the lungs and skin of persons, in the second and third stages of phthisis especially, are certainly sometimes productive of consumption, more particularly in young persons of a scrofulous diathesis, and in those who are predisposed by other causes, or who are subjected to several concurring influences. The inhalation by the healthy of the emanations from the lungs and skin of the consumptive, and the consequent appearance of the disease in the former, may, as in other cases of infection, be productive of its injurious effects only in the circumstances now stated, but the disease is caused by infection, nevertheless, although the fact is stated loosely by many writers as one of the propagation of phthisis by contagion, and denied by others, as, indeed, the infectious nature of nearly every disease has been denied by some, who consider belief in infection to be credulity, and skepticism to be a proof of a strong-minded physician, or rather of an incredulous old woman. Although phthisis, in the circumstances favorable to infection, may be communicated to others, especially when the healthy sleep in the same bed or apartment with the sick, and although this result is, perhaps, more likely to occur in persons under or about the period of puberty than at a much more advanced age, yet for many years after puberty the person thus exposed and predisposed may be attacked; and this result is the more likely to take place in

*"Principles and Practice of Physic," London, 1857, page 217.

†"Dictionary of Practical Medicine," New York, 1859, page 1228.

the cases of married, especially recently married, persons. I state this as the result of my observation; and although the matter has been discussed from the days of Galen, and the occasional transmission of the disease by infection believed by him, by Riverius, Morton, Van Swieten, Norducci, Roncalli, Cauvet, J. Frank, Hufeland, Hilderbrand, and many others, and denied by Salmade, Castallani, Portal, and numerous other writers, it still remains in dispute."

The late Prof. Dickson says*:—

"I would use the more cautious language of Cullen, and say that 'I dare not assert that it never is contagious.'"

The distinguished English physician and orator on medicine, Dr. W. Budd, says†:—

"The following are the principal conclusions to which I have been led, regarding phthisis or tubercle:—

First.—That tubercle is a true zymotic disease, of specific nature, in the same sense as typhoid fever, scarlet fever, typhus, syphilis, etc., etc., are.

Second.—That like these diseases, tubercle never originates spontaneously, but is perpetuated solely by the law of continuous succession.

Third.—That the tuberculous matter itself is (or includes) the specific morbific matter of the disease, and constitutes the material by which phthisis is propagated from one person to another, and disseminated through society.

Fourth.—That the *deposits* of this matter are, therefore, of the nature of an eruption, and bear the same relation to the disease, phthisis, as the 'yellow matter' of typhoid fever, for instance, bears to typhoid fever.

Fifth.—That by the destruction of this matter on its issue

*"Elements of Medicine," Philadelphia, 1859, page 625.
†"*The Lancet*," October, 1867.

from the body, by means of proper chemicals, or otherwise —seconded by good sanitary conditions—there is reason to hope that we may, eventually, and possibly at no very distant time, rid ourselves entirely of this fatal scourge.

The evidence on which these conclusions are founded, is drawn from the following principal sources :—

(*a.*)—Considerations based on the pathology of phthisis, as showing it to consist of the evolution and multiplication within the organism of a specific morbid matter, with a universal tendency to elimination, and casting forth of the same, after the type of zymotic diseases generally.

(*b.*)—Actual instances in which there was evidence to show that phthisis was communicated from one person to another.

(*c.*)—The geographical distribution of phthisis in past and present times, and especially its great fatality now in countries which, when first discovered by Europeans, were known to be entirely free from it.

(*d.*)—Its much greater prevalence in low levels and among crowded communities, and its entire absence, unless by casual importation, at very high levels, — conditions which are well known to rule, in the same directions, the spread of zymotic diseases generally, and especially of that group in which, as in phthisis, the morbific matter is cast off in a liquid form.

(*e.*)—Its very high rate of prevalence in convents, harems, barracks, penitentiaries, etc.,—that is to say, under the very social conditions which are known most to favor the propagation of diseases of the zymotic group.

Among the data relating to geographical distribution the following striking facts may be here mentioned :—

First.—When the South Sea Islands were first discovered Phthisis did not exist there. Since the aborigines have come into intimate contact with the Europeans the disease

has not only made its appearance among them, but has become so wide spread as to threaten their extermination.

The contrast between original entire immunity and present extreme fatality is very striking, and can only be rationally explained by the importation of a new and specific morbific germ.

Try every other supposition, and the facts are inexplicable; make this one supposition, and they are at once explained.

Second.—The late Dr. Rush, of Philadelphia, who made very accurate inquiries to determine the point, satisfied himself that when America was first discovered, phthisis was unknown among the native American Indians. Now it is very fatal to them.

The very significant contrast here exhibited between the past and present history of these two races in respect of phthisis, is exhibited at once, and at the present time among the negro race in Africa, in different parts of the area of that great continent.

It is well known that Negroes are peculiarly liable to phthisis.

Now, everywhere along the African seaboard, where the blacks have come into constant and intimate relations with the whites, phthisis causes a large mortality among them. In the interior, where intercourse with the whites has been limited to casual contact with a few great travelers or other adventurous visitors, there is reason to believe phthisis does not exist. Dr. Livingston and other African travelers have given me the most positive assurances on this point.

The idea that phthisis is a self-propagated zymotic disease, and that all the leading phenomena of its distribution may be explained by supposing that it is disseminated through society by specific germs contained in the tuberculous matter cast off by persons already suffering from the

disease, first came into my mind unbidden, so to speak, while I was walking on the Observatory hill, at Clifton, in the second week of August, 1856. The close analogy, in many quite fundamental points, between this disease and typhoid fever, had often impressed itself on me with very great force while I was engaged in the study of the latter, and in the preparation of the papers which I have published on it. I now saw, with a clearness which had never occurred to me before, that, with the exception of the qualification necessary for their application to a chronic disease,—for the most part of slow evolution and indefinite duration—the leading conclusions to which I had been led respecting the propagation of the fever, might be applied with the same strictness to phthisis also.

This idea had no sooner taken possession of my mind than considerations of great force, and in overwhelming number, crowded upon me in illustration of it.

In the course of the same evening, I drew up some notes on the subject, and, before the end of the month, my views upon it had taken, in outline, the exact shape which they now have. The long interval which has occurred between the Summer of 1856 and the present date has been occupied in collecting data bearing on the various questions raised by this new theory—in accumulating evidence of various kinds, and in examining and carefully weighing difficulties. During the whole of this long time the subject has scarcely ever been absent from my mind. The result has been only to confirm me more and more in the truth of my first conclusions. I earnestly hope that they will not be lightly rejected. At any rate, I can say that they have not been brought forward in haste, or without due deliberation. I have, in fact, considerably exceeded the ten years, which, with a fine sense of what is due to such an enterprise, the Roman poet prescribed as the time to be

given to every composition intended by the writer to endure."

Lawson Tait, M D., in speaking of the contagiousness of phthisis, states* :—

"A lingering suspicion, however, seems to exist in the minds of most medical men, for we constantly hear of the advice being given that the patient should sleep alone. For my own part, I never fail to impress this condition, for I entertain the belief strongly, that pulmonary consumption may be communicated by prolonged contact, especially as in sleeping, between the healthy and diseased."

Walshe says† :—

"Curiously enough, of the first three clinical assistants I had at Brompton, two died of phthisis, and the third left the establishment with slight hæmoptysis, cough and chest uneasiness. The latter is now (1871) in perfect physical condition, one of the former had clearly been affected before he came to the hospital, the other was a model of sturdy health when he took the office. * * * * I must confess my belief in the reality of such transmissibility has of late years been strengthened. I have met with so many examples of the kind, that 'coincidence' becomes itself an explanation difficult of acceptance. I have besides, in three instances, seen a robust husband become distinctly and actively phthisical, as shown by general and local symptoms and physical signs, and on the death of his phthisical wife, whom he had closely tended, fell into the retrogressive stage of the disease, and ultimately practically recover."

Andral, in his notes to Laennec's "Treatise on Auscultation," states‡ :—

*"*American Journal of the Medical Sciences*," October, 1871.

†"Diseases of the Lungs," London, 1871, page 459.

‡Quoted in *Dublin Journal of Medical Sciences*, Vol. XLVI., page 107.

"No doubt the facility of the contagion of phthisis pulmonalis has been very much exaggerated. Still, is it wise to deny it absolutely and in all cases? Who could venture to affirm that a disease which can never be considered as purely local, and which, according as it advances, presents, as it were, an infection of the entire system, is not susceptible of being transmitted in cases where very close and continual contact (as lying in the same bed) exposes a healthy individual to absorb the miasms driven off both from the pulmonary mucous membrane and the skin of a phthisical patient? I certainly have been more than once struck at seeing women begin to present the first symptoms of pulmonary consumption a short time after their husbands had died of this disease. At all events, the facts ascertained on the subject of the contagion of phthisis are of sufficient importance to induce those who are in constant attendance on phthisical patients to take all possible precautions, more especially during the advanced stages of their disease."

Dr. Thos. Moore Madden, in an exceedingly interesting article on "The Climate of Malaga, and its Influence on Chronic Pulmonary Disease, especially Consumption,*" states that:—

"It is a curious circumstance, however, that the mortality from phthisis in Malaga is becoming notably greater each year; and though, of course, some part of this increase is owing to the growth of the population, and a still larger proportion is occasioned by the deaths of foreign invalids, yet a considerable number of phthisical deaths remain which can not be thus accounted for. Hence a belief in the infectious nature of consumption is very generally entertained here, and many of the lodging-house proprietors ob-

*"*Dublin Journal of Medical Sciences*," Vol XL., page 33.

ject to receive phthisical invalids. I may here observe that the belief in the communicable character of consumption prevails very extensively in Southern Europe, especially in the south of Spain and Italy, and particularly in Naples. This opinion, though it may be traced back to many of the old writers, will now find few supporters in this country. I can not help thinking, however, that, in hot climates at least, there is a good deal of truth in it; and that constant communication with consumptive patients, such as sleeping in the same room with them, and breathing an atmosphere charged with the morbid exhalations from their diseased lungs, is very likely to prove injurious to persons in delicate health, and may even determine the occurrence of phthisis in individuals who might otherwise have escaped this malady."

Others holding to the same view, and cited by Dr. Young,* are F. Hoffmann, T. Reid, Raulin, S. G. Vogel, C. T. Selle, and A. P. Wilson.

In order to ascertain the views of some of the prominent authorities of the present day, the writter addressed letters of inquiry to several gentlemen, and received the following communications in reply:—

Prof. Alfred Stillé states:—

"I have never seen more than one case in which it appeared to me that the disease was directly communicated. This was of a mother, between fifty and sixty, whose husband many years before had died of consumption. She was herself in excellent, *tough* health up to the date of her daughter's last illness, which was with chronic phthisis with cavities. A day before her death the daughter's breath was very offensive, and the mother, who was lifting her to change her pillows, inhaled it. She spoke to me of the

*"Practical and Historical Treatise on Consumptive Diseases," London, 1815.

foul taste and acrid sensation in her throat produced by the inhalation. Within a few weeks she began to cough, fell rapidly into consumption, and died after several months' illness. This is the only case of my own that appears to bear upon the affirmation of the question.

On the other hand, if pulmonary phthisis were often conveyed by contagion, the cases ought to be of daily occurrence, since the disease is the most frequent of all mortal diseases.

While C. T. Williams concludes that the disease is not infectious, the vast experience and sagacity of his father, C. J. B. Williams, led him to declare that, 'both reason and experience indicate that a noxious influence may pass from a patient in advanced consumption to a healthy person in close communication, and may produce the same disease.' The latter is my own opinion, and I always feel it my duty to advise that a consumptive's bed should be shared by no one."

Prof. J. M. DaCosta writes me :—

"I have met with a number of instances which seemed to prove the contagiousness of phthisis. I am a believer in this, although I admit the great difficulty of eliminating the law of coincidence in a disease as common as tubercular phthisis. To mention a few of the instances I have met with :—

I attended a gentleman of tubercular family, and himself suffering from very slowly developing consumption, which in truth was arrested for a number of years. He thrice married, and lost his three wives by consumption. The third was a woman of splendid physique, and of a very healthy, long-lived family. She was the mother of three children ; one is scrofulous.

The case of a young woman, twenty-six years of age,

in whose family, the patient assured me, there never had been a case of phthisis. She died sixteen months after her husband, who had had a slowly progressing consumption. She left two children.

A similar case in a splendid looking young woman, who most faithfully nursed a tubercular husband for nearly two years. She died a year afterwards of phthisis, beginning, apparently, with throat and bronchial irritation. She had, I think, no children.

A young woman, who accompanied her husband to Colorado, where he died a year ago of a slow consumption. She is tubercular now; no case of phthisis has been known in the family, except that of her mother's aunt. One of the children of the young widow died of a scrofulous affection.

I might give you many more examples, and I have noticed the fact that they chiefly happen in women."

J. Solis Cohen, M. D., writes:—

"I am strongly impressed with the opinion that phthisis can be contracted, that is to say, is communicable rather than contagious in its strict sense, from frequent continuous contact with the phthisical.

I attended, during a series of ten years, one son and two daughters, all young adults, of a gentleman of this city, and subsequently the father himself, at about the age of fifty years, all of whom died of phthisis under my care. Two sisters of the father died of phthisis also, under the care of another practitioner, both married, with several children, probably a dozen or fourteen in all, all of whom are still living, with all the manifestations of phthisis.

The father had an aunt, a stout, hale, hearty Englishwoman, who nursed these children when they became sick, often sleeping with them, and subsequently she contracted

acute phthisis, and died under my care within seven weeks, at the age of about sixty-four, some members of her own family, (sisters,) surviving her at a more advanced age, and in good health.

I have also had several cases in which wife or husband died of phthisis several years after the death by phthisis of the other party; in one and, perhaps, more instances, after second marriage, in which I have thought, the personal history being unphthisical, that the germs of the disease had been contracted from sleeping with the diseased individual."

Edgar Holden, M. D., of Newark, N. J., writes me that it is —

"My personal observation and belief that persons with consumption may fatally affect those who are long and closely connected with them."

Here terminate the evidence and opinions on record and from other sources, of various authors of experience, so far as the research of the writer has been made. And now looking down the vista of ages for a period of more than two thousand years, the gloom of this appalling disease has been made all the more terribly manifest by the light at intervals thrown upon it by such illustrious names as have from time to time been cited in this article — from Hippocrates, the greatest physician of the ancients, to the experienced writers and teachers of the present day. Their teachings have been regarded as impregnable truths, and have acquired almost the infallibility of a religious creed.

The authorities who ignore, or evade the subject are not many, but include such names as Trousseau and Niemeyer. This is to be regretted, as their large experience and opportunities for observation in this direction could have aided materially in settling this important and sadly-neglected

mooted question. Others again pass it by, by merely stating, in effect, that there is a diversity of opinion in regard to the subject. Still less in number are those who oppose or deny the idea—or, rather, *fact*—of the contagiousness of phthisis, but to this matter we will return after the perusal of a few more original cases which have been kindly communicated to the writer, and a view of some others that are upon record.

Joachin M. Quilez, M. D. of Cuba, communicates the following case to the writer, and states that he has been familiar, personally, with both families and knows definitely of their antecedents:—

"A gentleman whose family was subject to hereditary phthisis, married a strong, healthy, well-developed young lady in whose family no such disposition existed, and in which no case of phthisis could be traced. A female child of delicate, though healthy aspect, was the first fruit of said union; a second child, of more delicate health, was born, and died in early childhood. The father, after being sick for some time, died from his hereditary affection; and the wife, whose health had begun to decline, was at last a victim to the same disease."

A. P. Brubaker, M. D., of this city, has kindly furnished the following case:—

"Mrs. K., aged thirty-three years, had always enjoyed good health until within the last six months; her parents are living, and well. Three years ago she married, her husband coming from a phthisical family; his mother and two sisters, it is said, died of consumption. At the time of his marriage, one of his sisters had been ill for a year with phthisis. Mrs. K. attended her constantly for a period of eleven months, when she died. Last August, nineteen months after the death of her sister-in-law, she

was seized suddenly with what she called 'hives,' followed, in the course of a week, with fever, slight cough with expectoration, loss of appetite and strength, which gradually became worse; she has lost flesh, and has had a slight hemorrhage, in fact, all the train of symptoms characteristic of phthisis."

James Simpson, M. D., of this city, has kindly furnished the writer with the three following cases:—

"Mrs. C., aged twenty-eight years, of a healthy, long-lived family. She was perfectly well on marriage. Her husband died in Iowa, of phthisis. Four months after his death I attended her with slight hemorrhage; dullness was found at apex of left lung, very limited. She died four months after, of well marked phthisis. She was one of thirteen children, all of whom, with the exception of Mrs. C., are living. Her mother died at the age of fifty, with some disease of the liver; her father is still living. I attended her grandfather and grandmother, both of whom died when over eighty.

Mrs. M., aged thirty years, a strong healthy Irishwoman. She nursed her husband, who died of phthisis, in the early part of 1877. One month after his death, she had a profuse hemorrhage; on examination a spot of dullness was found on the anterior part of the right lung. She was under my care for four months; the disease spread rapidly, involving the whole of the right and the apex of the left lung. Mrs. M's brothers and sisters are all living. She had four children, all strong and healthy.

Mrs. G., of a healthy family. Knew her to be well during her married life. Her husband died of phthisis; whom she nursed for one year. A month after his death she showed symptoms of bad health, with slight cough. Examination revealed disease of anterior portion of apex of left lung. She died in eighteen months, of phthisis."

J. Bernard Brinton, M. D., of this city, has kindly communicated the following case:—

"A lady, in whose family there was no tuberculous tendency, who was herself fat and healthy, married a gentleman, with whom she lived twenty-two years, when he died of consumption. He was sick with the disease for fifteen years before he died. About six weeks after he died she was seized with a hemorrhage, and is now rapidly failing with pulmonary consumption."

C. B. Coventry, M. D., records the two following cases*:—

"A young lady of fine health and form was, from exposure, seized with what is usually termed a severe cold, which terminated in consumption. A brother, who attended upon her the latter part of her illness, was seized with symptoms of phthisis about the time of her death, and in a few months was placed beside his sister's grave. The youngest of the surviving sisters nursed him, and in eighteen months fell a victim to the same disease. The mother, between seventy and eighty years of age, and who attended upon her daughter, began to complain of cough and other symptoms of consumption, but survived for several years. Four daughters who had left home remained free from the complaint. Previous to the illness of the lady first mentioned, none of the family had exhibited any indication of consumption.

One of the nearest neighbors of my father was a family by the name of Tyler, consisting of two parents, five sons, and a daughter. If I was in search of models of fine form, strength, and prospects of long life, I know not where they could be found that would surpass that family. The eldest of the sons injured himself by chopping, on a trial of skill, with a person older and stronger than himself; his disease

*United States Medical and Surgical Journal, New York, 1835, page 392.

terminated in consumption, of which he died in the Spring. The second son, who attended his brother in his illness, was buried the following Spring, the fourth son the next Autumn, and the father the following Spring, and a pile of stones, the remains of the chimney, is now all that marks the place where the house once stood. This was many years since. The third son, who was absent at the time, and the daughter and fifth son, who were children, escaped the disease; and when I last heard from them were in good health."

The following interesting case rests on the authority of M. T. Guérin, the orthopædist*:—

"A female died in the third stage of phthisis, having shared her husband's bed until her last moments. The latter, who was originally of robust constitution, and sprung from a family none of the members of which had ever been phthisical, married a second time: the subject of this union was of good constitution and healthy parentage. Eighteen months after marriage he died of confirmed phthisis; his wife, who cohabited with him to the last, remarried shortly after, and in two years died of consumption. Her second husband, of strong constitution, and belonging to a family in which phthisis had never been heard of, perished of the same affection soon after the death of his wife."

D. F. Condie, M. D. of this City, records four cases,† synopses of which are as follows:—

"Mrs. T., aged twenty-six years. Two years after her arrival in this country, from Dublin, Ireland, her health began to decline, with all the symptoms of phthisis, of which she died. Her husband was assiduous in his attendance on her, night and day. A few months subsequent to the

British and Foreign Medical Review, Vol. IX., page 340.

†"*American Journal of the Medical Sciences*," July, 1871.

death of his wife, phthisis set in, and he died eighteen months afterwards. He was a man of strictly temperate habits, with a robust, well-developed, frame.

A young lady, after exposure, was attacked with acute bronchitis, which became chronic, and, after lingering for two months, all the symptoms of phthisis set in, and of which she died. She was nursed by a sister, who, at the end of eight months, died, with all the symptoms of phthisis. The father died of Bright's disease; the mother survived many years, and died of old age.

Miss B. After an attack of pneumonia, phthisis set in, which was verifyed by autopsy. She was nursed most faithfully and unremittingly by an older sister, who died a year subsequently, of phthisis. The mother died when the youngest was an infant; the father was living, and in good health.

Mr. M., of phthisical ancestry, married, when twenty-six years old, a young lady of excellent health. Dr. C. was well acquainted with several members of her family, for two generations back. Shortly after Mr. M.'s marriage, his health began to give way, the symptoms being that of phthisis. Subsequently, the health of Mrs. M. began to decline, especially after the birth of her first child; her health failed more rapidly than her husband's; she had all the symptoms of phthisis, of which she died. Mr. M. lingered some months after, when he died."

Lawson Tait, M. D., records* a case, a synopsis of which is as follows:—

"He was consulted by a young girl suffering with phthisis, who had lost her mother and one brother by that disease. She was accompanied on her visit by a friend, who had occupied the same room and by whom she was nursed during

*American Journal of the Medical Sciences, October, 1871.

her illness, of which she recovered; her friend, who was the very picture of health, began to show signs of phthisis, of which she died. Long before death the condition of the two girls was reversed: the patient had become the nurse, and the nurse had taken the patient's bed. A family history of the unfortunate girl was obtained. Her father, mother, and several brothers and sisters were alive and strong. She had a grandfather and two grandmothers living, and no instance had occurred in the family of death from chest disease or any of the usually allied affections. Nor in her own history was there any point which could be indicated as one of likely explanation for the phthisis."

The following is selected from eight cases, presumably due to contagion, recorded by Henry J. Bowditch, M. D.:*—

"Miss S., of a family in which phthisis was not known to have existed, nursed a lady friend, who died of phthisis after one year's illness. Miss S. died of phthisis two years after her friend's decease."—(*Synopsis only.*)

C. W. Stevens, M. D., records the following case†:—

"Mr. R., aged twenty-nine, died of phthisis after three years' sickness. He had returned home from abroad, only six months before his death. He was nursed chiefly by his young wife, and assisted by her mother. His wife had a fine constitution, a well developed body, and had always been healthy. Her mother was likewise a very robust woman, of middle age, with no hereditary consumptive tendencies. This young wife was incessant in her devotion to her husband — constantly setting beside him, breathing his breath, bathing his body, and emptying his sputa and excretions. Near the end of his life, she was taken with a slight diarrhœa. After his decease, she appeared to go

*"*Boston Medical and Surgical Journal*," 1864, page 329.
†"*Boston Medical and Surgical Journal*," 1872, page 168.

into a decline, and died of acute tuberculosis, in about six months. About a year afterwards her mother likewise died of consumption."

Prof. Austin Flint, M. D., states*:—

"The possibility of the communication of the disease from husband to wife, or from wife to husband, involves the inquiry:—Is the disease ever communicated through the intimate relations belonging to married life? I shall give a brief synopsis of the cases in my collection, containing facts relating to this inquiry."

[The writer sets aside the first case because two sisters of the patient died of phthisis.]

"Mr. F., aged twenty-two, consulted me in August, 1864. Both parents were living and well. In November, 1863, he had married, and his wife was then affected with phthisis. She was still living, in an advanced stage of the disease. He had hæmoptysis, in March, 1874. He was now emaciated, and the physical signs showed unequivocally phthisis. At the time of his marriage, he was in robust health. * * * He had most of the time occupied the same bed with her.

"F. L. W., aged about forty, had profuse hæmoptysis in June, 1867. The signs then showed considerable solidification of the upper lobe of the right lung. The hæmoptysis returned in July. Meanwhile the solidification had much diminished, showing that there had been an intercurrent pneumonia. In September, the solidification was moderate, and his general condition good. ' He subsequently went to Europe, and died in the Spring of 1870. There was no tuberculous antecedents in the family of this patient, but his wife had died of phthisis not long before he had the disease

*"On Phthisis, Philadelphia, 1875, page 419.

(the precise length of time not noted), and he had devoted himself to attentions to her during her illness.

Mrs. E., aged twenty-eight, consulted me in October, 1870. Her husband had died with phthisis two years before, and she was with him constantly during his illness. In February, 1870, she had pneumonia. Cough had continued since that time. Hæmoptysis had occurred in May. There had been diarrhœa much of the time for two months. She had lost twenty-one pounds in weight. The physical signs showed cavity at the summit of the right lung. Death took place in January, 1873.

Mrs. O., aged forty-five, in February, 1855, had had phthisis for eighteen years. At this date her general health was fair. There was dullness on percussion at the summit of the chest on the right side, with increase of vocal resonance, and feebleness of the respiratory murmur. She had had numerous attacks of hæmoptysis. She had been married twenty-one years. Her husband had had phthisis for twenty-seven years. Repeated attacks of hæmoptysis had occurred in this case, but his general health was fair. There was no evidence of a family predisposition in the case of Mrs. O. Her mother died with apoplexy, and her father met with a violent death."

H. Weber, M. D.,* read a paper before the Clinical Society of London, giving cases illustrative of the communicability of consumption from husband to wife :—

" He had tested the question in his practice during more than twenty years, his attention having been first directed to it by some striking cases. He had the history of the results of twenty-nine marriages between women with more or less marked signs of consumption, who married healthy men, and of fifty-one marriages of tainted men who married

*British Medical Journal, 1874, Vol. I., page 684.

healthy women. While only one of the husbands of the twenty-nine diseased wives became consumptive, eighteen of the fifty-one healthy women married to diseased husbands died from consumption. The eighteen women were the wives of nine husbands, one of whom lost four wives, one three, four two, and three one each."

The author who opposes the contagiousness of phthisis with the greatest force, is Dr. Henry MacCormac, of Dublin, Ireland. In his ingenious and interesting work,* he states that :—

"Consumption is not communicated by any infection or contagion, whatever, any more than a fractured limb is so communicated."—(*p. 109.*)

Yet he declares in the most vehement manner that phthisis is engendered and propagated by pre-breathed air. We will select one sentence, and in doing so it will be, in a manner, giving the text of the whole book :—

"If we poison the atmosphere with the products of respiration, the atmosphere so empoisoned poisons us in turn." —(*p. 127.*)

He thus, inadvertently, makes himself one of the strongest advocates of the contagiousness of phthisis, as he teaches more than he really meant at the time of writing his book, for it is well known that the effete matter thrown off from the lungs of a person who has phthisis, especially in the advanced stages of the disease, contains, besides the usual effete material, pus, and muco-pus, in fact all the constituents of tuberculous matter. Now, is it not reasonable that, if pre-breathed air will produce phthisis, that air loaded with such material as the above would be more likely to cause it, for herein reside the material cause ?

It has been proved, beyond all question, that tubercle can

*"On Consumption," London, 1865.

be inoculated, according to the elaborate research of Dr. J. A. Villemin,* who used tubercle from the human subject on rabbits, Guinea-pigs, dogs, cats, sheep, and birds; and he believes that, by his experimental researches, he has substantiated the following facts:—

That tuberculosis is the effect of a specific casual agent,—a virus. This agent, like its congeners, is discoverable in the morbid products, which are the result of its direct action upon the normal elements of the affected tissues. Introduced into an organism capable of being affected by it, this agent is reproduced, and, at the same time, reproduces the disease of which it is the essential principle and the determining cause.

True, Villemin was not successful in *all* his experiments, neither do *all* persons, exposed to any of the zymotic diseases, become affected with them; but all his experiments have been confirmed by a multitude of ingenious experimenters, including such names as Cohnheim, Waldenburg, Herard, Lebert, Cornil, Simon, and Wilson Fox.† And yet another distinguished experimenter, Dr. William Marcet,‡ suggests, in effect, that the inoculation of animals might be employed as a means of proving the diagnosis in doubtful cases, for he gives, as the result of a number of observations, made with great care, that the sputa of phthisical patients is capable of leading to the formation of tubercle in some animals, as Guinea-pigs, when introduced into them by inoculation. He carried his investigations still further:—He took blood from phthisical patients, inserted it into animals, and found tubercle to result. These same experiments, with like results, have likewise been performed by Villemin, who is also a firm believer in the transmission of tubercle by contagion.

*"Etudes sur La Tuberculose," Paris, 1868.
†"The Artificial Production of Tubercle in the Lower Animals," London, 1868.
‡"Medico-Chirurgical Transactions," 1867.

There is a case recorded,* where a human subject was inoculated with tuberculous matter; it was that of a fisherman who had gangrene of the great toe, due to obliteration of the femoral artery. He was inoculated in the upper part of his thigh. He died thirty-seven days later, and tubercle was discovered in his lungs and liver.

The apex of the lungs is the part which is the least expanded, and most often the seat of consolidation. In 4,530 cases examined by Pollock,† the deposit began at the apex in all but 64.

The preference that tubercle manifests for the lungs in tuberculosis is in harmony with the law of choice or affinity which attaches to zymotic diseases generally. No one doubts the fact of the existence of typhoid poison in the blood prior to its being made manifest by a lesion in the glands of Peyer. Nor can we doubt of the existence of a like contaminating influence in the blood before we note the peculiar pathological condition known as pulmonary tuberculous. The tubercle, still preserving the harmony of the general law, is nothing more than the culmination of the process of the disease, the softening and breaking down of which is an inherent weakness of the *materies morbi*, and being a foreign matter, the lungs rebel against its presence, and make an effort to cast it off. Thus, then, we conclude that the blood is attacked primarily, the disease having a period of incubation, or pre-tubercular stage; the individual is in a pathological condition prior to the development of tubercle.

The writer of the present article agrees with Dr. P. M. Latham,‡ that "Pulmonary Consumption is no more than a

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**Gazette, Medical*, 1872, page 192. Quoted in *Biennial Retrospect of Medicine and Surgery*, 1871-72, page 38.

†"Elements of Prognosis in Consumption," London, 1865, page 135.

‡"Clinical Lectures," *Bell's Journal*, Philadelphia, 1837, Vol. I., page 133.

fragment of a great constitutional malady which it would be vain to think of measuring by the stethescope, and which belongs to a higher discipline than any mere skill in auscultation rightly to comprehend." This accords with the fragment of a number of diseases belonging to the zymotic group, such as the characteristic excreta of typhoid fever; of the false membrane of diphtheria; the eruption and throat affection of scarlet fever; the eruption of small-pox, measles, and erysipelas. All these *fragments* are capable of propagating the diseases of which they are the result respectively, precisely as the exhalation from a phthisical patient will produce phthisis.

Pollock states that* :—

"The examination of the aged, proves that consumption may exist independently of tubercular development, contrary to the opinions of Louis and Laennec."

This also accords with a number of diseases belonging to the zymotic group; with diptheria, where we only have the characteristic sequelæ present, the faucial mucous membrane never being attacked or affected; or again with scarlet fever, without eruption, the sequelæ being most marked; or further still, as we see in some epidemics of small-pox, with cases modified by vaccination without eruption, and know the case symptomatically.

It is well known that altitude has great influence over some of the zymotic diseases, especially typhoid fever and malaria, and for its influence on phthisis especially, the reader is referred to an elaborate and classical paper,† by Charles Denison, M. D., of Denver, Colorado.

It will be noticed that all the original cases in this article are females; this very fact not only proves the correctness of

*"Elements of Prognosis in Consumption," London, 1865, page 135.

†"Transactions of the International Medical Congress," Philadelphia, 1877.

the statement of that distinguished authority, Prof DaCosta, "that they chiefly happen in women," but also proves that phthisis is a contagious disease. The writer firmly believes that if it were possible for a correct clinical history to be obtained of the females who died of phthisis in Philadelphia, in the ten years 1867–1876, ($50\frac{9}{10}$ per cent. of the whole number,) it would be found that more than the excess of $1\frac{4}{5}$ per cent. of females could be proved to be due to contagion. The reason that women are attacked more often with the disease, is readily enough explained by the fact that theirs is the office of ministering angels in the sick room—always at their post of duty, night and day, like the Roman soldiers of old, and like them would rather die than give up their charge. There are few physicians who have not known of instances where women have nursed for from six to twelve months, in lingering disease, other than phthisis, who were "run down" in health, through loss of sleep, appetite, strength, and became anæmic, etc., from constant attention and anxiety, and yet did not contract phthisis from these causes. It is not to be understood by this that we hold that every woman or man who nurses a case of phthisis, will contract the disease, but only that it does occur sufficiently often for the physician to recognize the fact. If there be an hereditary taint—the powder—in the nurse, and if she take charge of a phthisical patient—the spark—there is no doubt that the chances are against her safety; whereas, if she do not expose herself to its further influence, she may live a long life and finally die of some other disease.

The writer affirms that there is more danger to be dreaded from nursing the phthisical than there is from nursing cases of typhoid fever; in the latter the 'material cause' resides in the excreta, and by cleanliness the contagious element is destroyed and removed; not so in phthisis, for in that disease the 'material cause' resides in the effete matter constantly

being thrown off from the lungs of the stricken individual, more especially in the advanced stages of the disease.

The late Dr. Cotton,* of Brompton, may have said truly that "a residence in the consumptive hospital, and long-continued working in its wards, is a very good way, indeed, *not to catch the disease*," as there is a great difference between the nursing of the phthisical in hospital and in private practice; in the former there is one skilled nurse to probably a dozen or more patients, and they occupy their own apartments after being on duty a portion of the twenty-four hours, and hygiene and regimen are carried out to the highest point of excellence known. Not so in the latter, for here all patients have their own nurses, either some member of the family or friend, who are unskilled, and, as a rule, the circumstances under which they perform their office are such as to render them more liable to fall victims to contagion.

That there must be something more than inheritance to keep up the enormous mortality of this disease, is quite evident from the investigations that have been made by some of the most competent observers. Dr. E. Darwin Hudson, jr., in an elaborate monograph on phthisis,† states that "Dr. Cotton analyzed one thousand cases at the Brompton Hospital, and could prove hereditary taint in but three hundred and sixty-seven. Scott Allison's observations at the same Institution (out of six hundred and three cases he has only seen the influence manifested in nineteen cases)‡ were equally negative. Walshe, by careful inquiry among the phthisical, concludes that not over 26 per cent. have had parents affected with phthisis. M. Pidoux says "not over 25 per cent. of those born of consumptive parents themselves become so." The remaining 70 or 75 per cent. must be due to

British Medical Journal, 1872, Vol. II., page 239.

†"Transactions of the New York Academy of Medicine," 1876, page 149.

‡"Transactions of the New York State Medical Society," 1871, page 172.

other causes than inheritance, and among these I believe contagion to hold a prominent place.

That phthisis is a contagious disease, and therefore belongs to the zymotic group, the evidence and proof, as herein presented, is, the writer believes, decisive and irrefragable.